

Application No. 09/954,947
Attorney Docket No. 34-UL-120827 (13322US01)

REMARKS

The present application includes claims 1-32. Claims 1-32 were rejected. Claims 1, 3, 13, 16, 21 and 23 are amended in response to the Examiner's rejections. In addition, claims 3-4, 16 and 23-24 are amended to correct typographical errors.

Claims 1 and 13 are amended to recite additional limitations of a housing having an acoustic window portion, wherein the window portion allows ultrasound beams and echoes to pass through the housing and wherein the window portion defines a range of transducer array motion. Claim 21 is amended to recite additional limitations of providing a housing having an acoustic window portion, wherein the window portion allows ultrasound beams and echoes to pass through the housing and wherein a transducer array pivots around a rotation axis across a range of transducer array motion defined by the window portion. Claims 3 and 16 are amended to recite additional limitations of a transducer array connected to a drive shaft and a gear connected to the drive shaft. Claim 23 is amended to recite additional limitations of mounting a transducer array on a drive shaft and providing a gear connected to the drive shaft. Claims 3-4, 16 and 23-24 are also amended to correct typographical errors.

Claims 1, 3-4, 13, 16, 21 and 23-24 were rejected under 35 U.S.C. § 102(b) as being anticipated by Mochizuki et al., U.S. Patent No. 5,152,294.

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Claims 3, 16 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mochizuki in view of Okunuki et al., U.S. Patent No. 5,460,179.

Claims 4 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mochizuki in view of Cerofolini, U.S. Patent No. 5,740,804.

Claims 7-8, 19-20 and 27-28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mochizuki in view of Angelsen, U.S. Patent No. 4,757,818.

Claims 10-12, 14 and 30-32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mochizuki in view of Cerofolini.

The Applicant first turns to the rejection of claims 1, 3-4, 13, 16, 21 and 23-24 under 35 U.S.C. § 102(b) as being anticipated by Mochizuki. Mochizuki relates to a three-dimensional ultrasonic scanner. The transducer unit of Mochizuki operates through an acoustic lens disposed at the convex end surface of the transducer unit (col. 3, lines 43-50). This acoustic lens is located on the transducer unit and not on the housing of the scanner (col. 3, lines 43-50; see also acoustic lens disposed at the convex end surface 28A and transducer unit 28 of Figures 2 and 3).

Mochizuki does not teach a housing having an acoustic window portion wherein the window portion allows ultrasound beams and echoes to pass through the housing and the window portion defines a range of transducer array motion. Conversely, Mochizuki describes an acoustic lens disposed at the convex end surface of the transducer unit (col. 3, lines 43-50; Figure 2).

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Claims 1 and 13 are amended to recite limitations of a housing having an acoustic window portion, wherein said window portion allows ultrasound beams and echoes to pass through said housing and wherein said window portion defines a range of transducer array motion. Claim 21 is amended to recite limitations of providing a housing having an acoustic window portion, wherein said window portion allows ultrasound beams and echoes to pass through said housing and mounting a transducer array wherein said transducer array pivots around said rotation axis across a range of transducer array motion defined by said window portion. As described above, Mochizuki does not teach any of these limitations.

Mochizuki describes a swing mechanism that is mechanically fixed to the transducer unit by way of a support shaft (col. 3, lines 51-66). That is, the transducer unit is mechanically fixed to a pair of arms, and these arms "are securely fixed to the support shaft" which is mechanically fixed to a motor (col. 3, lines 51-70 and col. 4, lines 1-5; Figures 2 and 3). Furthermore, the swing mechanism is moved through a fixed arc by a motor and a plurality of gears mechanically fixed to the support shaft (col. 3, lines 67-70 and col. 4, lines 1-12; Figure 2).

Thus, Mochizuki also does not teach a gear and a belt, wherein the belt couples the gear to the stepper motor. Conversely, as described above, Mochizuki describes a swing mechanism mechanically fixed to the transducer unit by way of a support shaft (col. 3, lines 51-66). Therefore, Mochizuki does not teach the limitation of a gear and a belt, wherein the belt couples the gear to the stepper motor.

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Claims 3 and 16 recite the limitation of a gear and a belt, wherein the belt couples the gear to a stepper motor. Claim 23 recites the limitation of providing a gear and a belt, wherein the belt couples the gear to a stepper motor.

Mochizuki also does not teach a control member comprising a handcrank. Instead, Mochizuki describes a swing mechanism powered by a motor, a gear section, a support shaft and suspension arms (col. 4, lines 5-12; Figure 2). Conversely, claim 4 recites the limitation of a control member comprising a handcrank and claim 24 recites the limitation of providing a handcrank.

The present rejection encompasses independent claims 1, 3-4, 13, 16, 21 and 23-24. Claims 1, 13 and 21 are amended to recite limitations not taught by Mochizuki. Applicant respectfully submits that claims 3-4, 16 and 23-24 recite limitations not taught by Mochizuki. Consequently, the Applicant respectfully submits that independent claims 1, 3-4, 13, 16, 21 and 23-24 should be allowable.

The Applicant now turns to the rejection of claims 3, 16 and 23 under 35 U.S.C. § 103(a) as being unpatentable over Mochizuki in view of Okunuki. Okunuki relates to an ultrasonic transducer assembly and method of scanning. Specifically, Okunuki describes a motor linked with a gear that moves the transducer assembly through the utilization of a belt (col. 7, lines 27-40). The motor moves the gear that is connected to a belt (col. 7, lines 27-40). The belt is guided by a plurality of rollers to the upper arm of the

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transducer assembly, where both ends of the belt are directly connected to the arm of the transducer assembly belt (col. 7, lines 27-40; Figure 3).

However, Okunuki does not teach a transducer array connected to a drive shaft. Furthermore, Okunuki does not teach a belt coupling a gear to a stepper motor, wherein the gear is connected to the drive shaft.

As described above, the swing mechanism of Mochizuki is mechanically fixed to the transducer unit by way of a support shaft (col. 3, lines 51-66). That is, the swing mechanism is moved through a fixed arc by a motor and a plurality of gears mechanically fixed to the support shaft (col. 3, lines 67-70 and col. 4, lines 1-12; Figure 2).

Mochizuki does not teach a transducer array connected to a drive shaft and a belt coupling a gear to a stepper motor, wherein the gear is connected to the drive shaft.

Claims 3 and 16 are amended to recite limitations of a transducer array connected to a drive shaft and a gear connected to the drive shaft, wherein a belt couples the gear to a stepper motor. In addition, claim 23 is amended to recite limitations of a transducer mounted on a drive shaft, wherein a gear is connected to the drive shaft and a belt couples the gear to a stepper motor. As described above, neither Okunuki nor Mochizuki teach any of these limitations.

The present rejection encompasses independent claims 3, 16 and 23. Claims 3, 16 and 23 have been amended to recite limitations not taught by either Okunuki or Mochizuki. Applicant respectfully submits that claims 3, 16 and 23 recite limitations that are not taught by either Okunuki or Mochizuki, alone or in combination. Consequently,

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the Applicant respectfully submits that independent claims 3, 16 and 23 should be allowable.

The Applicant now turns to the rejection of claims 4 and 24 under 35 U.S.C. § 103(a) as being unpatentable over Mochizuki in view of Cerofolini. Cerofolini relates to a multipanoramic ultrasonic probe. Cerofolini describes a transducer array rotated about each of two perpendicular axes by a motor and motor shaft (col. 6, lines 22-40; col. 6, lines 64-70 and col. 7, lines 1-16). The motors are each controlled by an electrical signal (col. 6, lines 49-63; col. 7, lines 17-27).

Cerofolini does not teach a handcrank employed to move or pivot a transducer array. More generally, Cerofolini does not teach the use whatsoever of any sort or type of handcrank.

As described above, Mochizuki relates to a three-dimensional ultrasonic scanner. The swing mechanism of Mochizuki is moved through a fixed arc by a motor and a plurality of gears mechanically fixed to the support shaft (col. 3, lines 67-70 and col. 4, lines 1-12; Figure 2).

Mochizuki does not teach a handcrank employed to move or pivot a transducer array. More generally, Mochizuki does not teach the use whatsoever of any sort or type of handcrank.

Claims 4 and 24 recite the limitation of a handcrank. As described above, neither Cerofolini nor Mochizuki teach a handcrank. Applicant respectfully submits that claims 4

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and 24 recite limitations not taught by either Cerofolini or Mochizuki, alone or in combination. Consequently, the Applicant respectfully submits that independent claims 4 and 24 should be allowable.

The Applicant now turns to the rejection of claims 7-8, 19-20 and 27-28 under 35 U.S.C. § 103(a) as being unpatentable over Mochizuki in view of Angelsen. Angelsen relates to an ultrasonic transducer probe with linear motion drive mechanism. The probe of Angelsen is disposed within a cover filled with a liquid that transmits the ultrasound beam through the front material of the probe (col. 4, lines 40-53).

Angelsen does not teach a housing having an acoustic window portion that allows ultrasound beams and echoes to pass through the housing wherein the window portion defines a range of transducer array motion. Specifically, Angelsen describes an ultrasound beam that is transmitted "through the front material of the probe" (col. 4, lines 48-53). Therefore, the probe of Angelsen transmits ultrasound beams through the probe cover material, and not through an acoustic window portion of a housing.

As described above, Mochizuki describes a transducer unit that operates through an acoustic lens disposed at the convex end surface of the transducer unit (col. 3, lines 43-50). This acoustic lens is located on the transducer unit and not on the housing of the scanner (col. 3, lines 43-50; see also acoustic lens disposed at the convex end surface 28A and transducer unit 28 of Figures 2 and 3). Also as described above, Mochizuki does not teach a housing having an acoustic window portion wherein the window portion

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allows ultrasound beams and echoes to pass through the housing and the window portion defines a range of transducer array motion. Claims 1 and 13 recite limitations of a housing having an acoustic window portion allowing ultrasound beams and echoes to pass through the housing, wherein the window portion defines a range of transducer array motion. Claim 21 recites limitations of providing a housing having an acoustic window portion allowing ultrasound beams and echoes to pass through the housing wherein the transducer array pivots around a rotation axis across a range of transducer array motion defined by the window portion.

Therefore, the Applicant respectfully submits that independent claims 1, 13 and 21 recite limitations not taught by either Angelsen or Mochizuki, alone or in combination. Consequently, the Applicant respectfully submits that claims 7-8, 19-20 and 27-28, which depend on independent claims 1, 13 and 21, should be allowable.

The Applicant now turns to the rejection of claims 10-12, 14 and 30-32 under 35 U.S.C. § 103(a) as being unpatentable over Mochizuki in view of Cerofolini. As described above, Cerofolini relates to a multipanoramic ultrasonic probe. The probe head housing of Cerofolini is made of appropriate plastic material that is transparent to acoustic waves for optimal acoustic transmission (col. 5, lines 47-50).

Cerofolini does not teach a housing having an acoustic window portion wherein the window portion allows ultrasound beams and echoes to pass through the housing and the window portion defines a range of transducer array motion. Conversely, Cerofolini

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describes a probe head housing made of appropriate plastic material that is transparent to acoustic waves for optimal acoustic transmission (col. 5, lines 47-50). Cerofolini does not teach an acoustic window portion that defines a range of motion of the transducer array.

As described above, Mochizuki describes a transducer unit that operates through an acoustic lens disposed at the convex end surface of the transducer unit (col. 3, lines 43-50). This acoustic lens is located on the transducer unit and not on the housing of the scanner (col. 3, lines 43-50; see also acoustic lens disposed at the convex end surface 28A and transducer unit 28 of Figures 2 and 3). Also as described above, Mochizuki does not teach a housing having an acoustic window portion wherein the window portion allows ultrasound beams and echoes to pass through the housing and the window portion defines a range of transducer array motion.

Claims 1 and 13 are amended to recite limitations of a housing having an acoustic window portion allowing ultrasound beams and echoes to pass through the housing, wherein the window portion defines a range of transducer array motion. Claim 21 is amended to recite limitations of providing a housing having an acoustic window portion allowing ultrasound beams and echoes to pass through the housing wherein the transducer array pivots around a rotation axis across a range of transducer array motion defined by the window portion.

Therefore, the Applicant respectfully submits that independent claims 1, 13 and 21 recite limitations not taught by either Cerofolini or Mochizuki, alone or in

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combination. Consequently, the Applicant respectfully submits that claims 10-12, 14 and 30-32, which depend on independent claims 1, 13 and 21, should be allowable.

Therefore, the Applicant respectfully submits that the claims of the present application should be allowable over the prior art.

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CONCLUSION

If the Examiner has any questions or the Applicant can be of any assistance, the Examiner is invited and encouraged to contact the Applicant at the number below.

The Commissioner is authorized to charge any necessary fees or credit any overpayment to the Deposit Account of GTC, Account No. 070845.

Respectfully submitted,

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